FIG.1

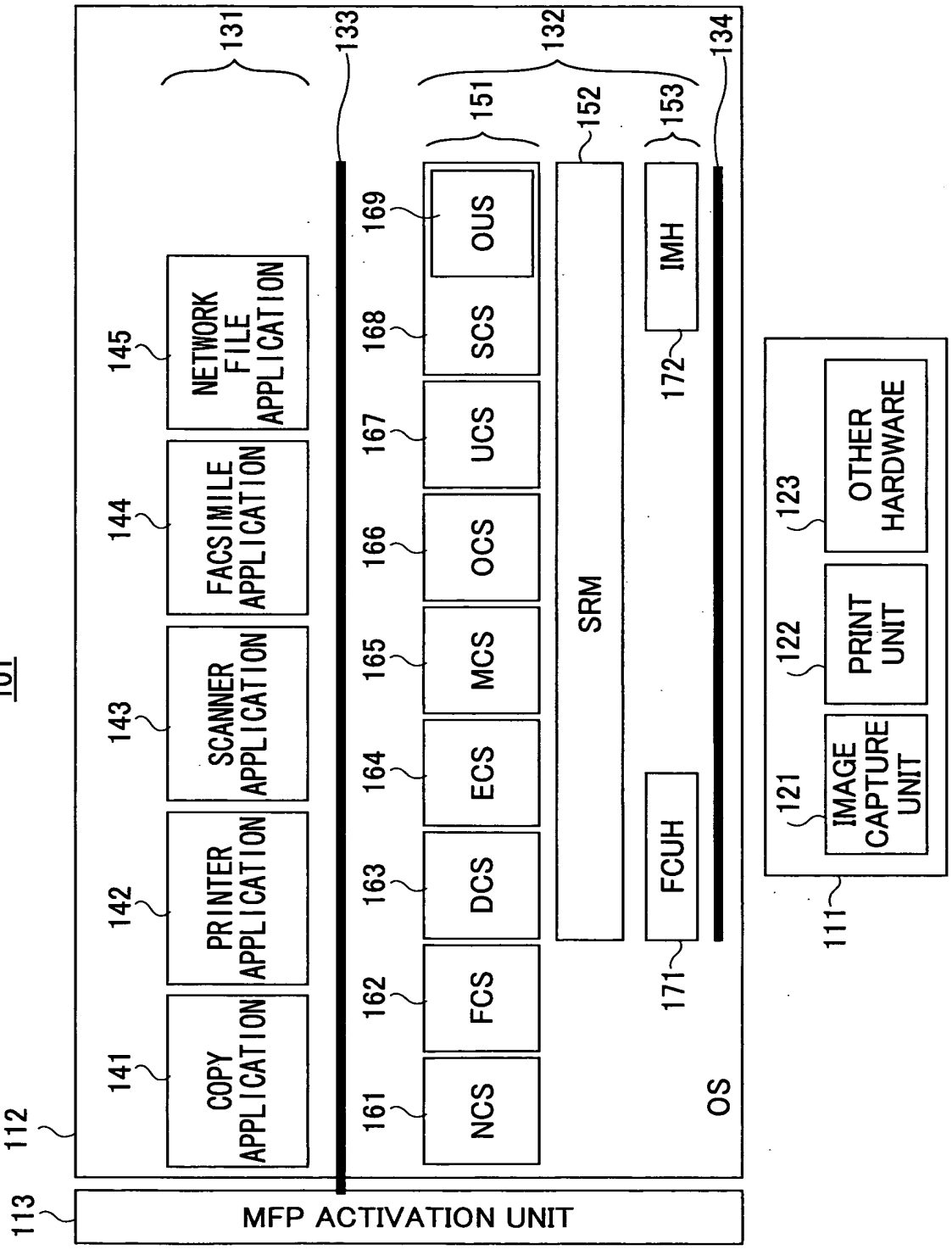

101
112
113
131
133
132
134
151
152
153
141
142
143
144
145
161
162
163
164
165
166
167
168
169
171
172
COPY APPLICATION
PRINTER APPLICATION
SCANNER APPLICATION
FACSIMILE APPLICATION
NETWORK FILE APPLICATION
NCS
FCS
DCS
ECS
MCS
OCS
UCS
SCS
OUS
SRM
FCUH
IMH
OS
MFP ACTIVATION UNIT
111
121
122
123
IMAGE CAPTURE UNIT
PRINT UNIT
OTHER HARDWARE

FIG.2

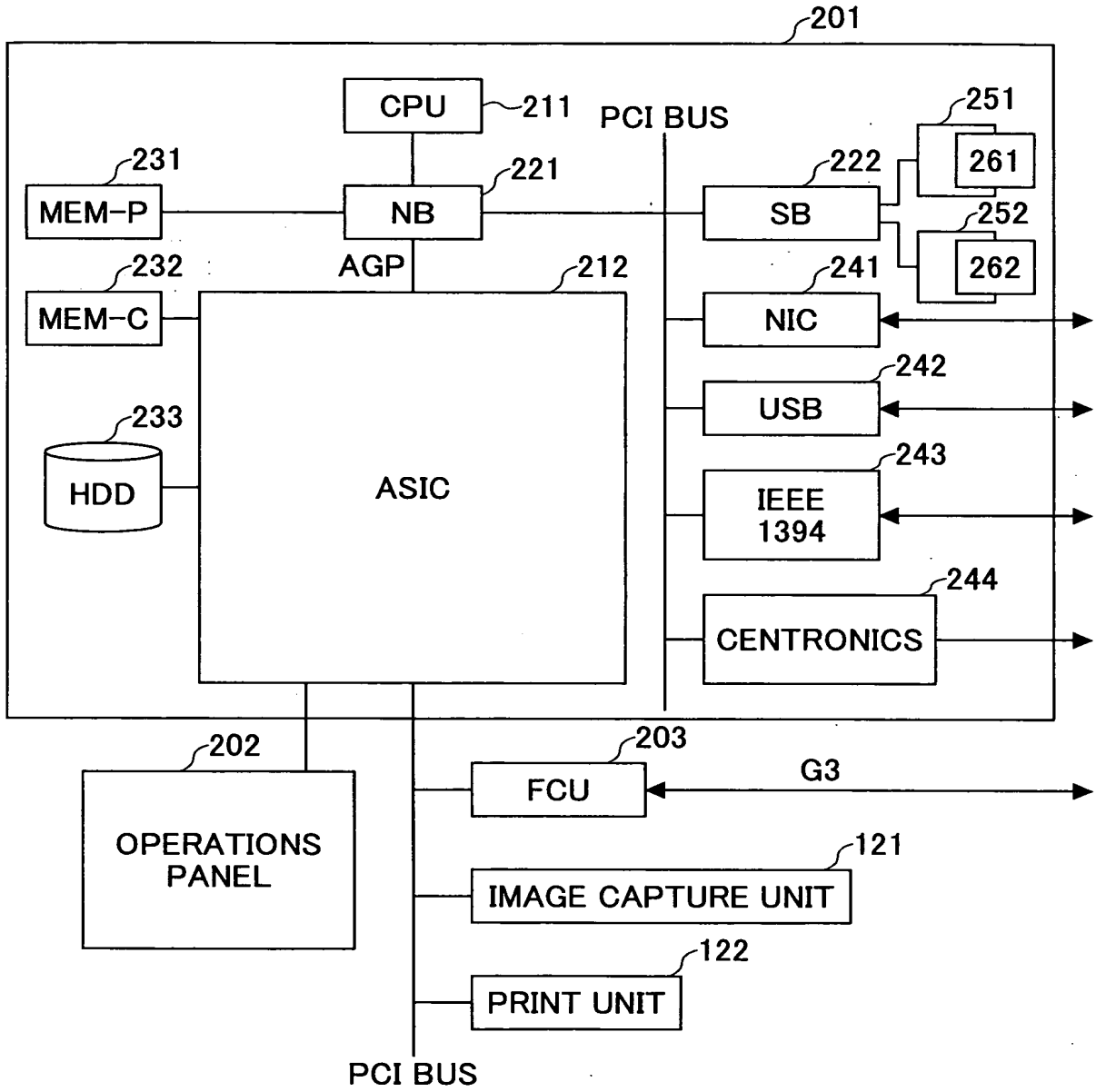

201
CPU
211
PCI BUS
251
261
231
MEM-P
NB
221
222
SB
252
262
AGP
232
MEM-C
212
241
NIC
242
USB
233
HDD
ASIC
243
IEEE
1394
244
CENTRONICS
202
203
FCU
G3
OPERATIONS
PANEL
121
IMAGE CAPTURE UNIT
122
PRINT UNIT
PCI BUS

FIG.3

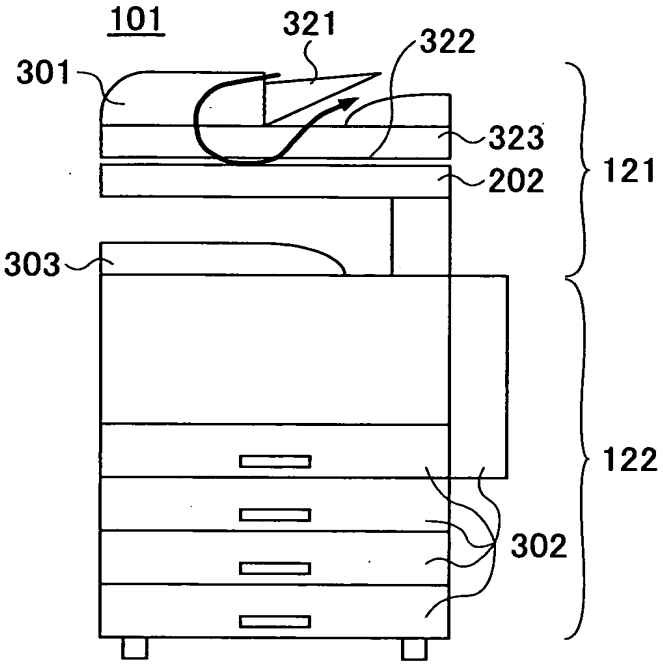

101
321
322
301
323
202
121
303
122
302

FIG.4

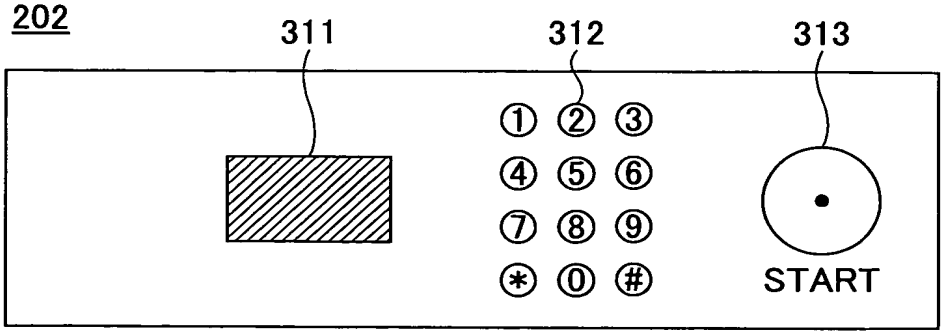

202
311
312
313
① ② ③
④ ⑤ ⑥
⑦ ⑧ ⑨
* 0 #
START

FIG.5

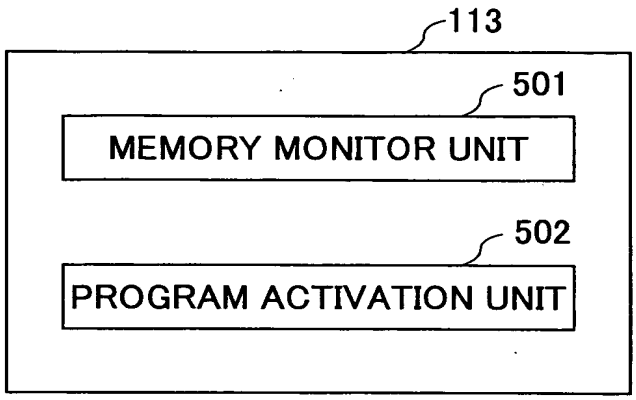


FIG.6

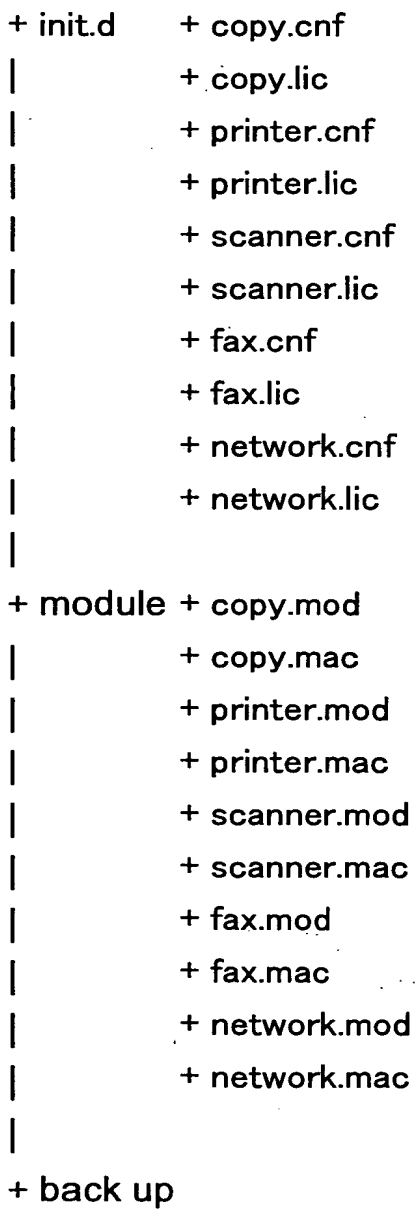

+ init.d
+ copy.cnf
+ copy.lic
+ printer.cnf
+ printer.lic
+ scanner.cnf
+ scanner.lic
+ fax.cnf
+ fax.lic
+ network.cnf
+ network.lic
+ module
+ copy.mod
+ copy.mac
+ printer.mod
+ printer.mac
+ scanner.mod
+ scanner.mac
+ fax.mod
+ fax.mac
+ network.mod
+ network.mac
+ back up

FIG.7

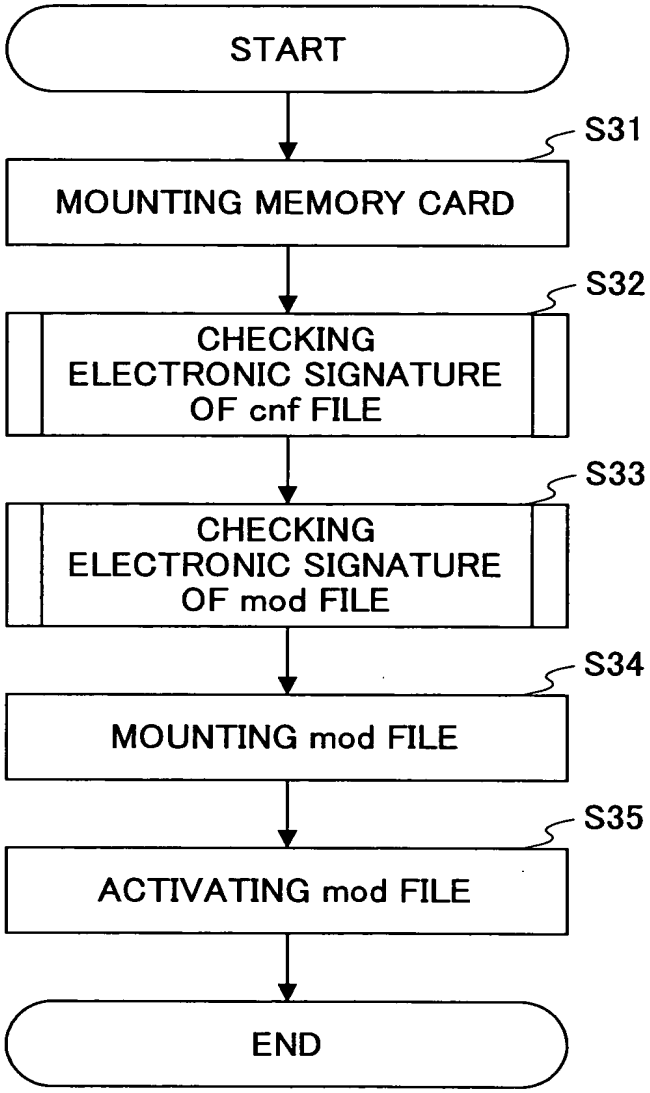

START
S31
MOUNTING MEMORY CARD
S32
CHECKING ELECTRONIC SIGNATURE OF cnf FILE
S33
CHECKING ELECTRONIC SIGNATURE OF mod FILE
S34
MOUNTING mod FILE
S35
ACTIVATING mod FILE
END

FIG.8

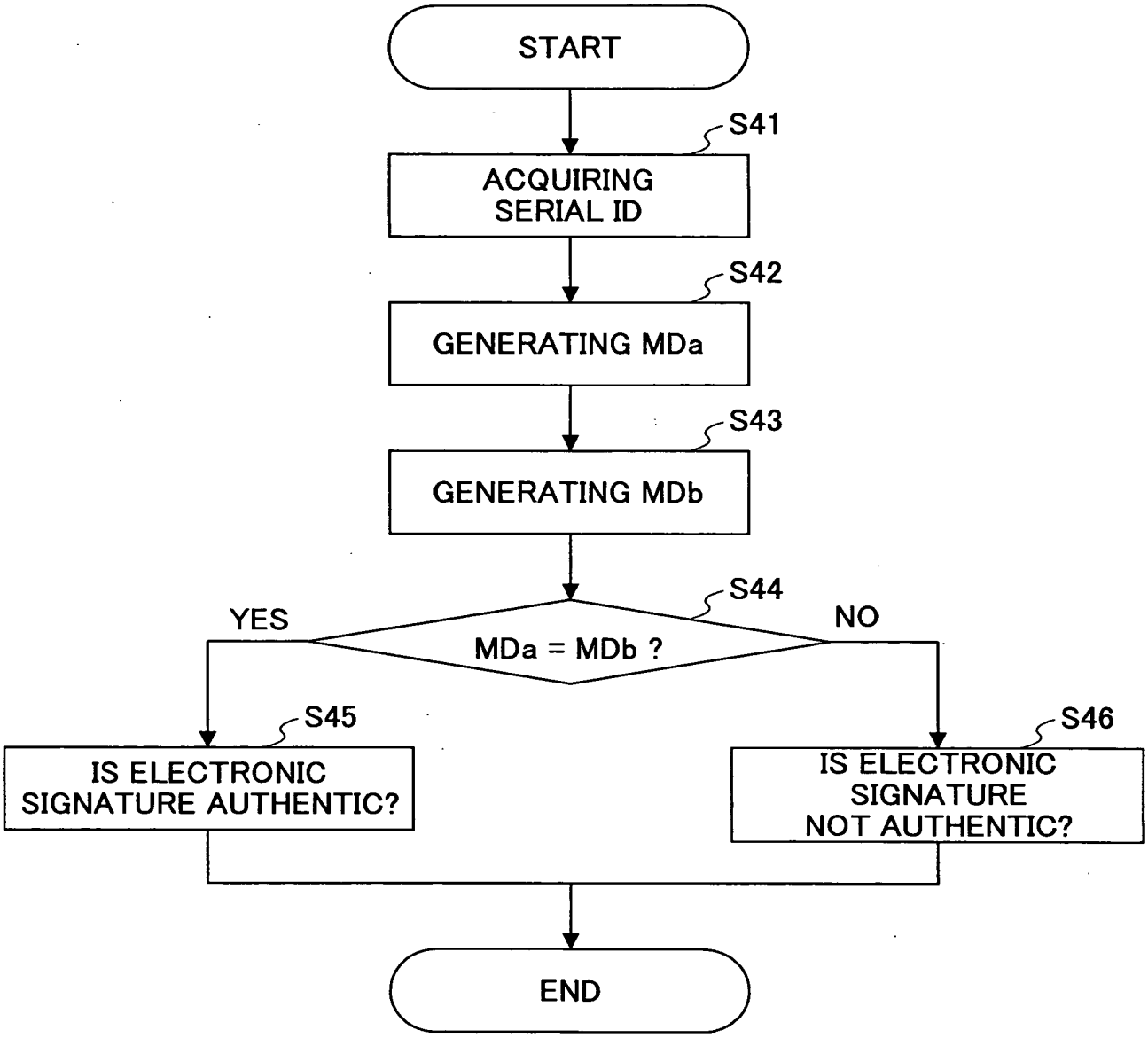

START
S41
ACQUIRING SERIAL ID
S42
GENERATING MDa
S43
GENERATING MDb
S44
MDa = MDb ?
YES
NO
S45
IS ELECTRONIC SIGNATURE AUTHENTIC?
S46
IS ELECTRONIC SIGNATURE NOT AUTHENTIC?
END

FIG.9

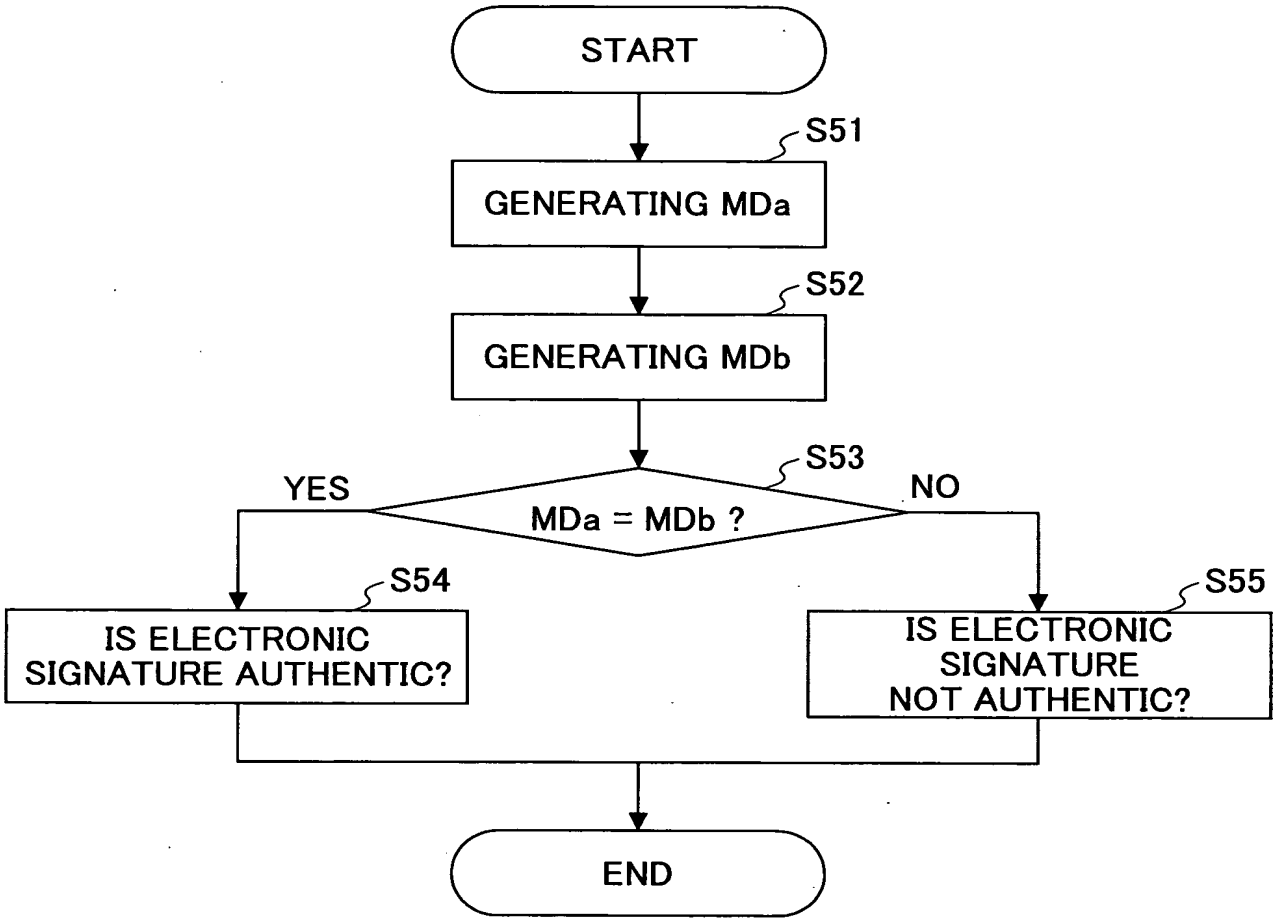

START
S51
GENERATING MDa
S52
GENERATING MDb
S53
YES
MDa = MDb ?
NO
S54
IS ELECTRONIC SIGNATURE AUTHENTIC?
S55
IS ELECTRONIC SIGNATURE NOT AUTHENTIC?
END

FIG.10

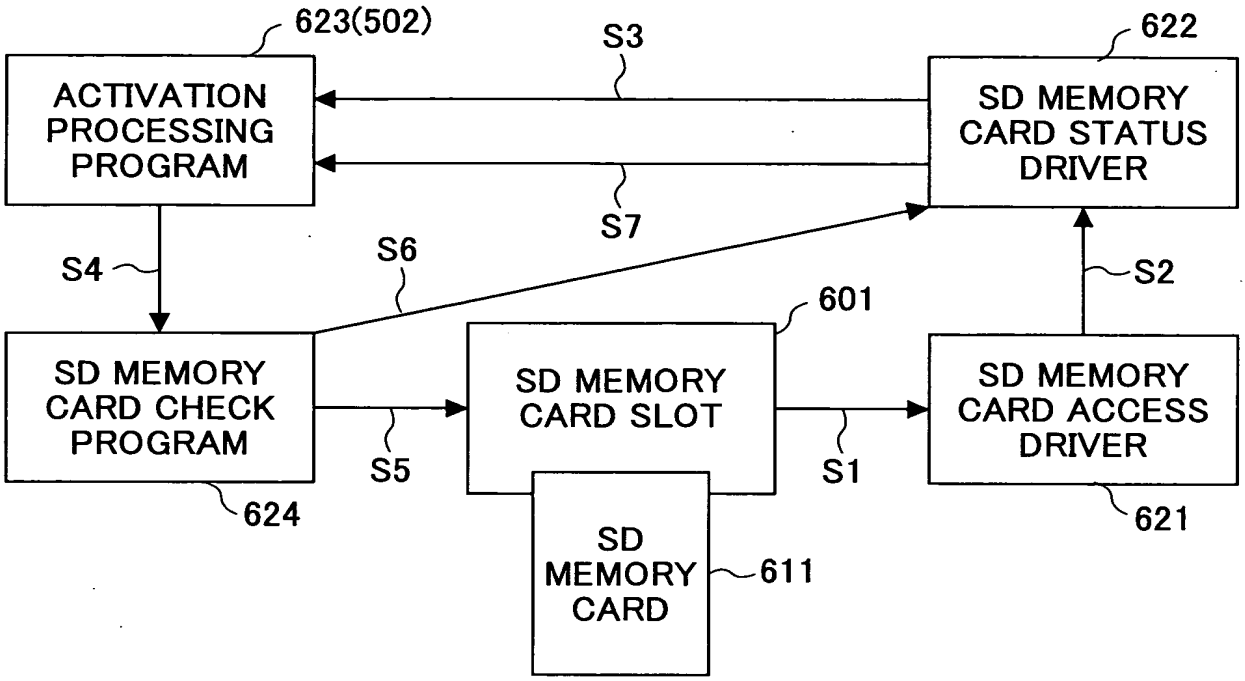

623(502)
ACTIVATION PROCESSING PROGRAM
S3
S7
622
SD MEMORY CARD STATUS DRIVER
S4
S6
S2
601
SD MEMORY CARD CHECK PROGRAM
SD MEMORY CARD SLOT
SD MEMORY CARD ACCESS DRIVER
S5
S1
624
621
SD MEMORY CARD
611

FIG.11

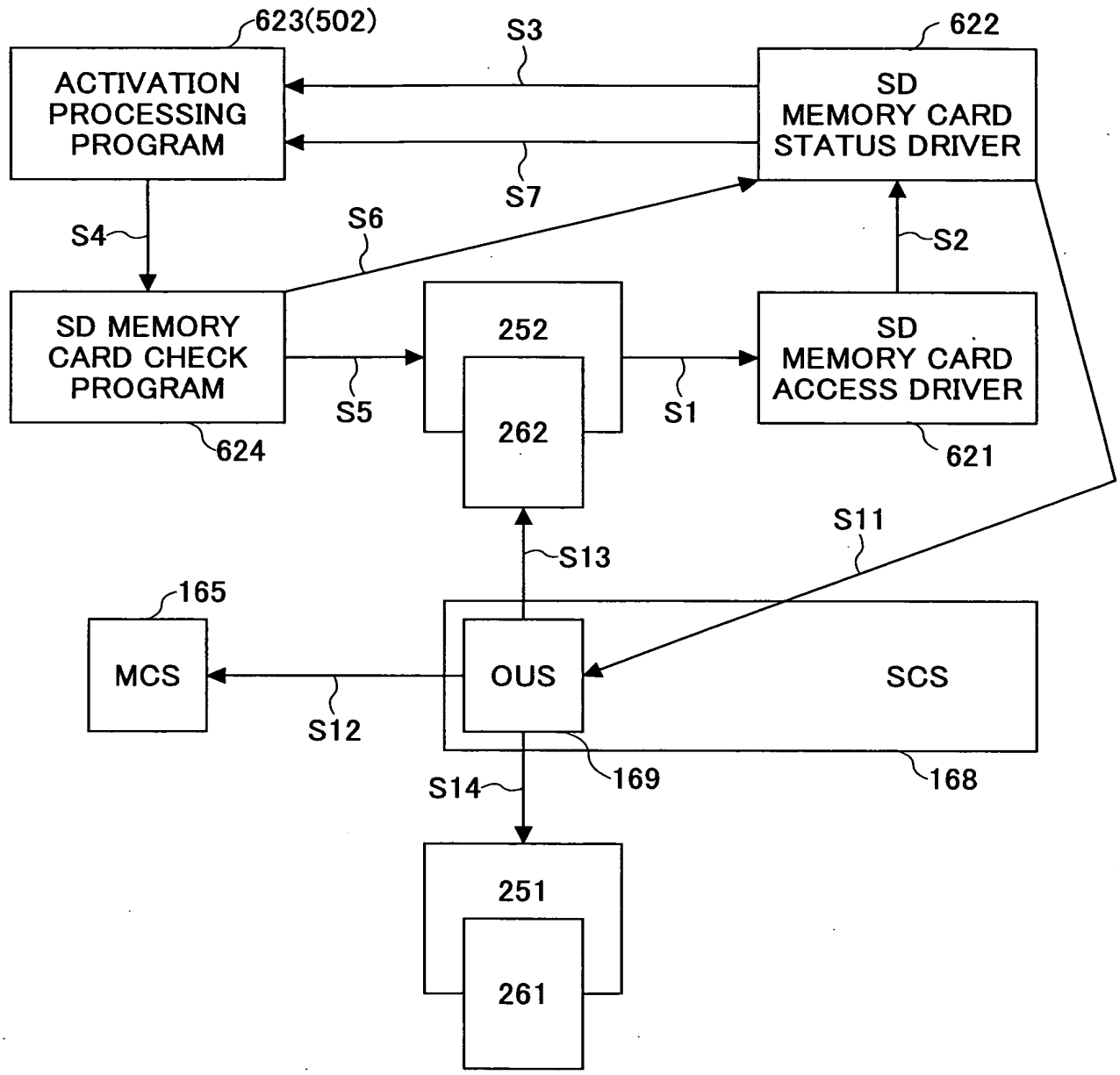

623(502)
ACTIVATION PROCESSING PROGRAM
S3
S7
622
SD MEMORY CARD STATUS DRIVER
S4
S6
S2
SD MEMORY CARD CHECK PROGRAM
624
S5
252
262
S1
SD MEMORY CARD ACCESS DRIVER
621
S11
S13
165
MCS
S12
OUS
SCS
169
168
S14
251
261

FIG.12

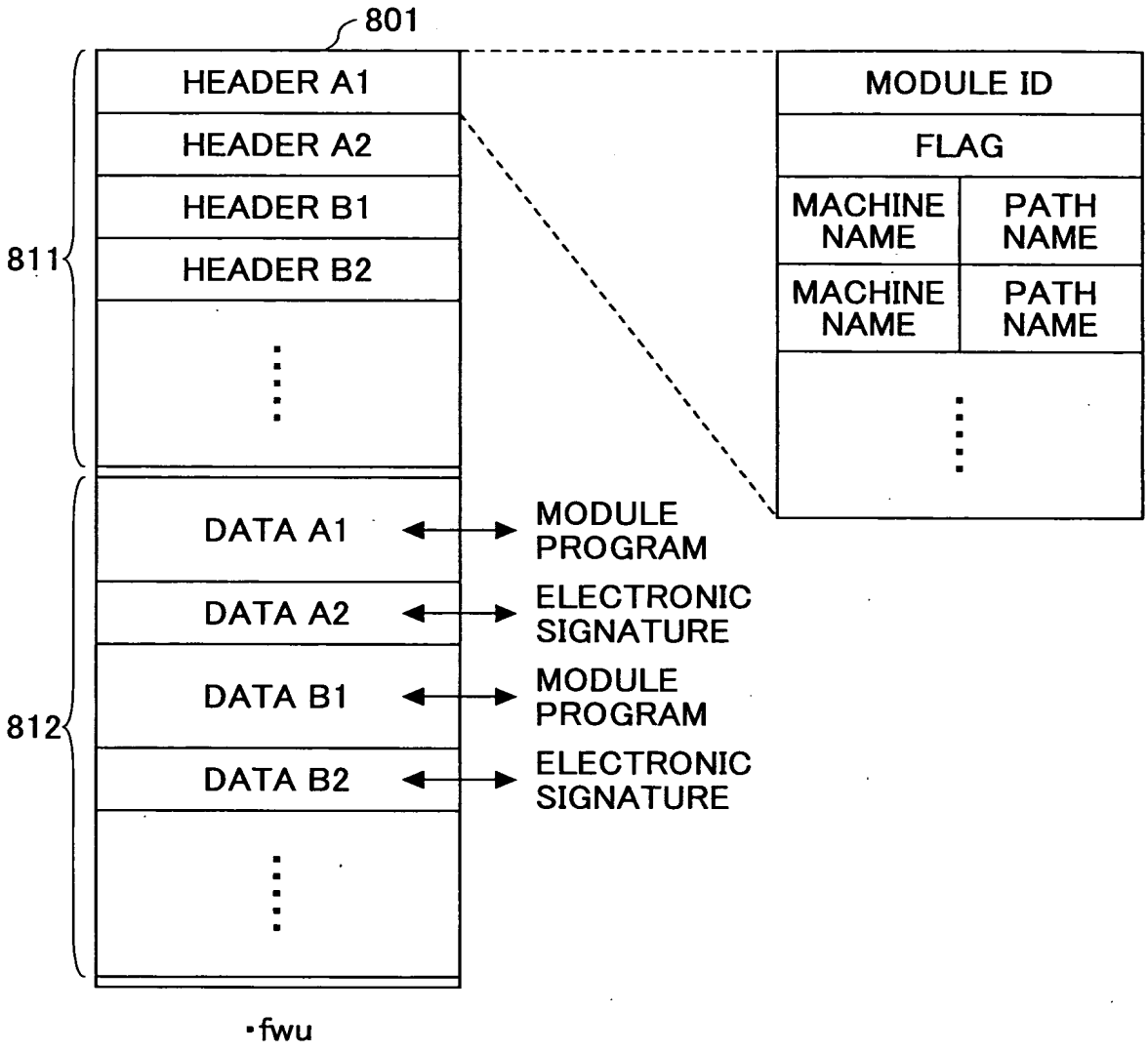

801
HEADER A1
HEADER A2
HEADER B1
HEADER B2
811
MODULE ID
FLAG
MACHINE NAME
PATH NAME
MACHINE NAME
PATH NAME
DATA A1
DATA A2
DATA B1
DATA B2
812
MODULE PROGRAM
ELECTRONIC SIGNATURE
MODULE PROGRAM
ELECTRONIC SIGNATURE
•fwu

FIG.13

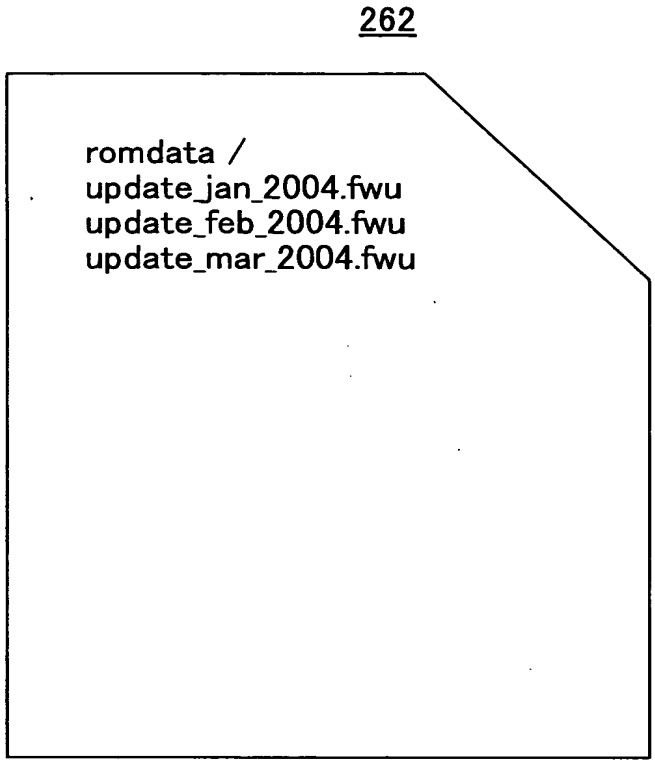

262
romdata /
update_jan_2004.fwu
update_feb_2004.fwu
update_mar_2004.fwu

FIG.14

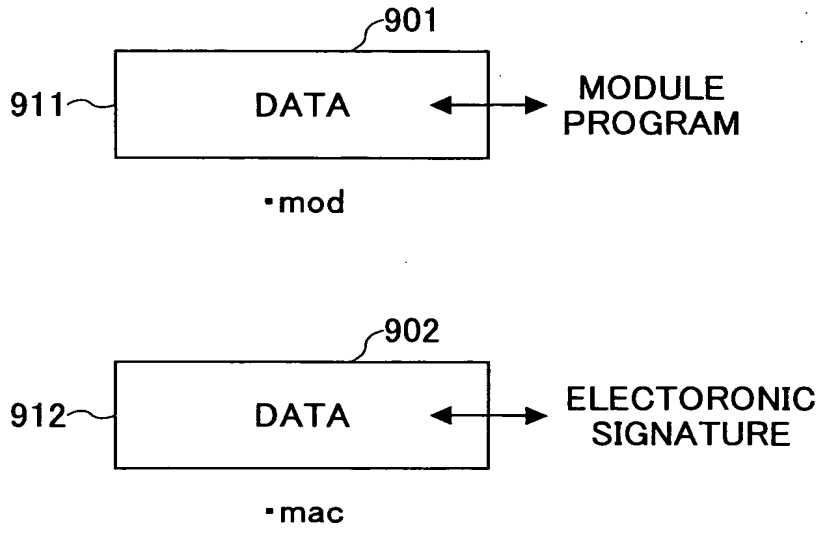

901
911
DATA
MODULE PROGRAM
・mod
902
912
DATA
ELECTORONIC SIGNATURE
・mac

FIG.15

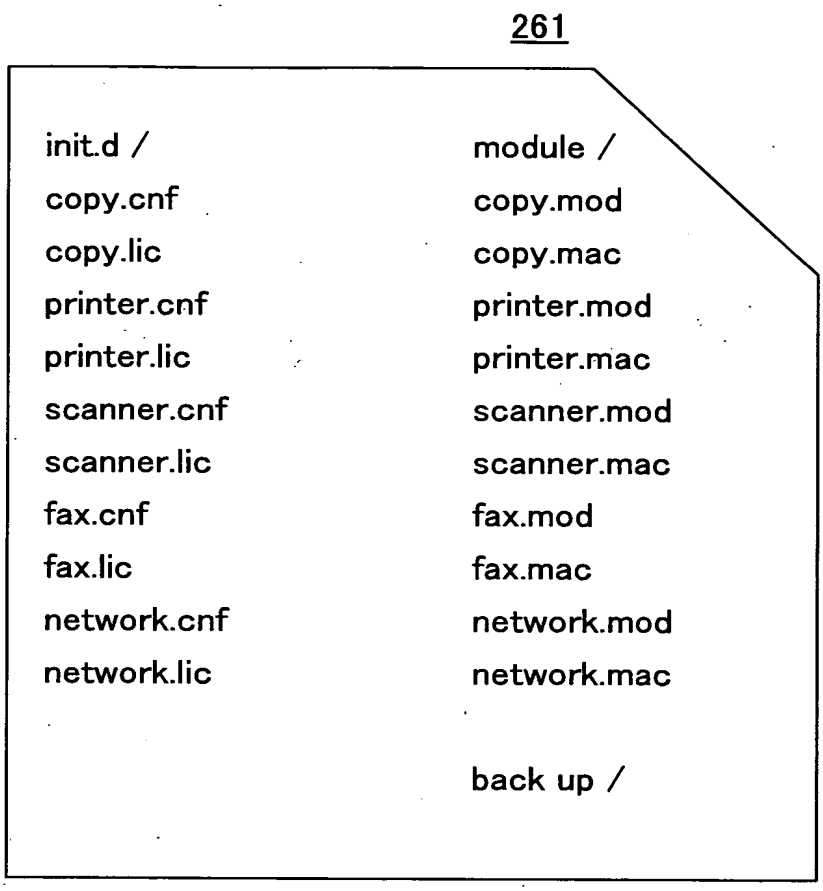

261
init.d /
copy.cnf
copy.lic
printer.cnf
printer.lic
scanner.cnf
scanner.lic
fax.cnf
fax.lic
network.cnf
network.lic
module /
copy.mod
copy.mac
printer.mod
printer.mac
scanner.mod
scanner.mac
fax.mod
fax.mac
network.mod
network.mac
back up /

FIG.16

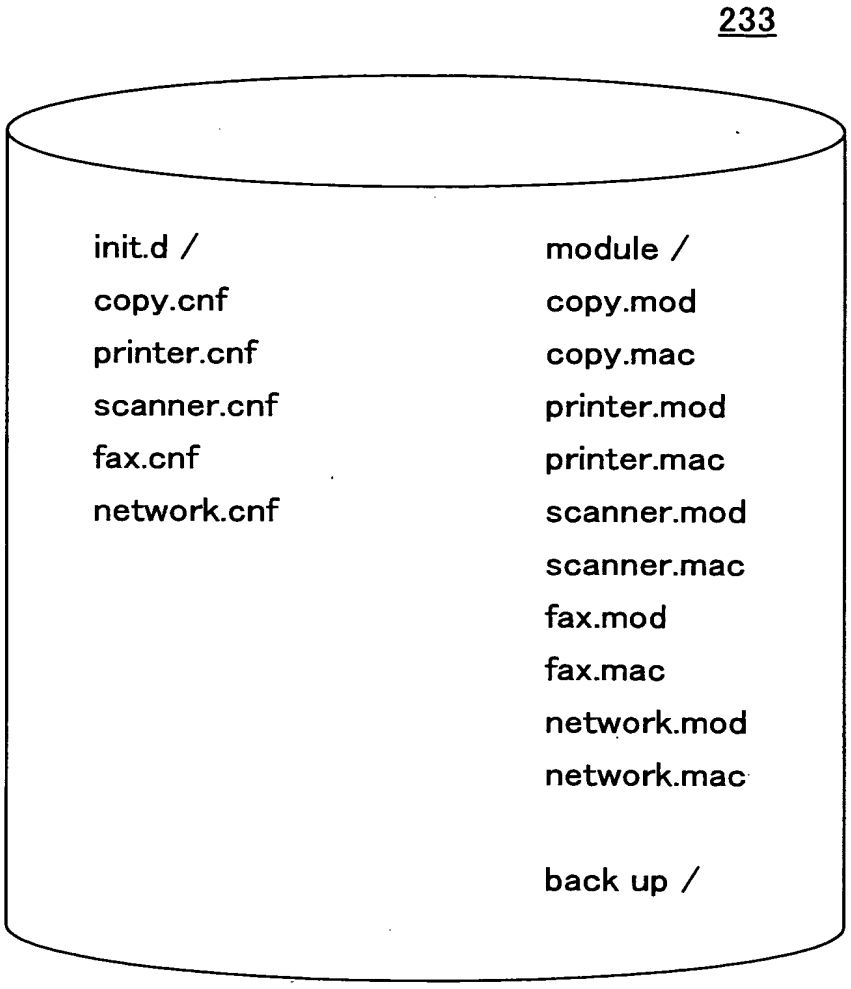

233
init.d /
copy.cnf
printer.cnf
scanner.cnf
fax.cnf
network.cnf
module /
copy.mod
copy.mac
printer.mod
printer.mac
scanner.mod
scanner.mac
fax.mod
fax.mac
network.mod
network.mac
back up /

FIG.17

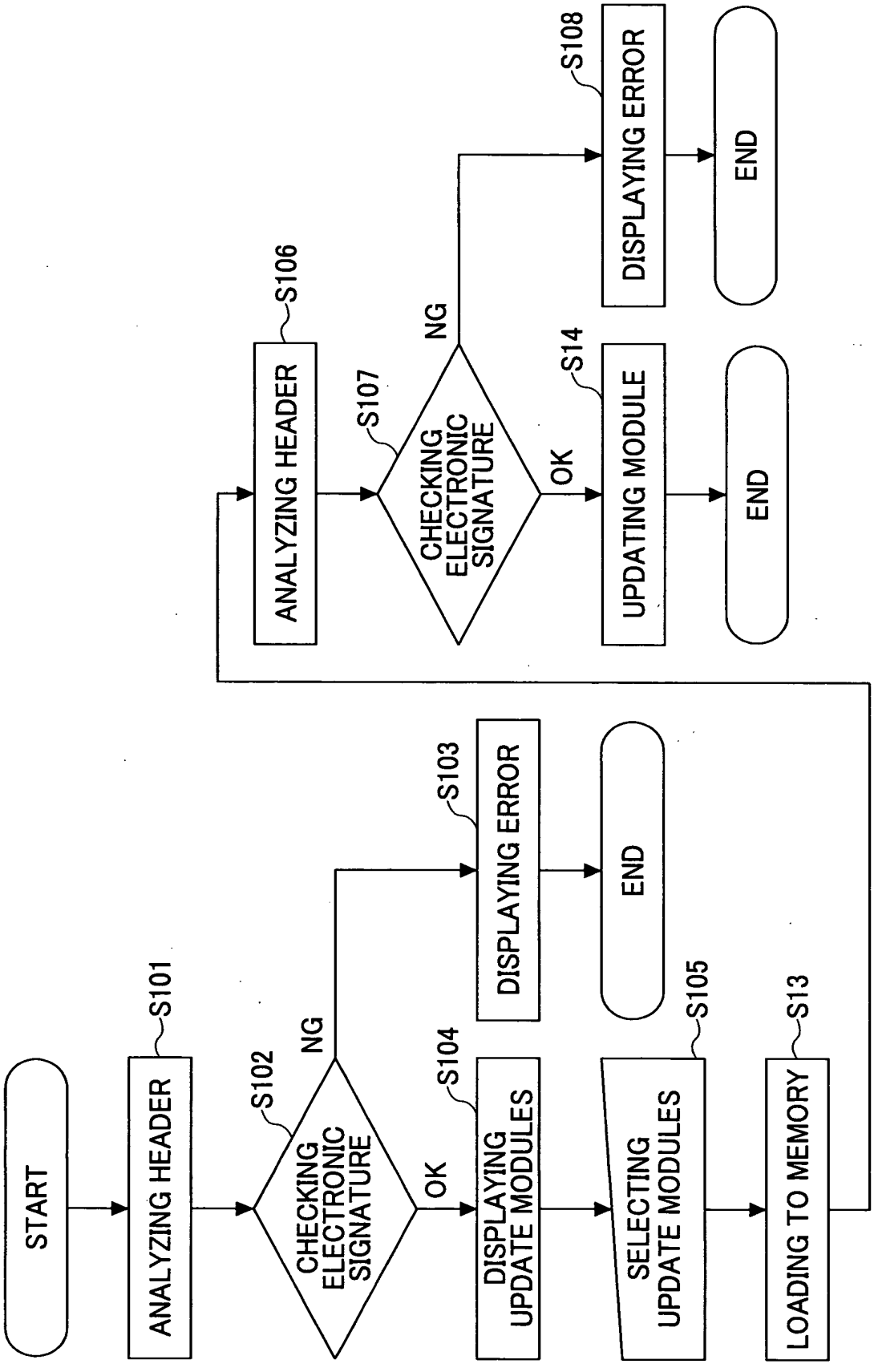

START
ANALYZING HEADER
S101
CHECKING ELECTRONIC SIGNATURE
S102
NG
DISPLAYING ERROR
S103
END
OK
DISPLAYING UPDATE MODULES
S104
SELECTING UPDATE MODULES
S105
LOADING TO MEMORY
S13
ANALYZING HEADER
S106
CHECKING ELECTRONIC SIGNATURE
S107
NG
DISPLAYING ERROR
S108
END
OK
UPDATING MODULE
S14
END

FIG.18

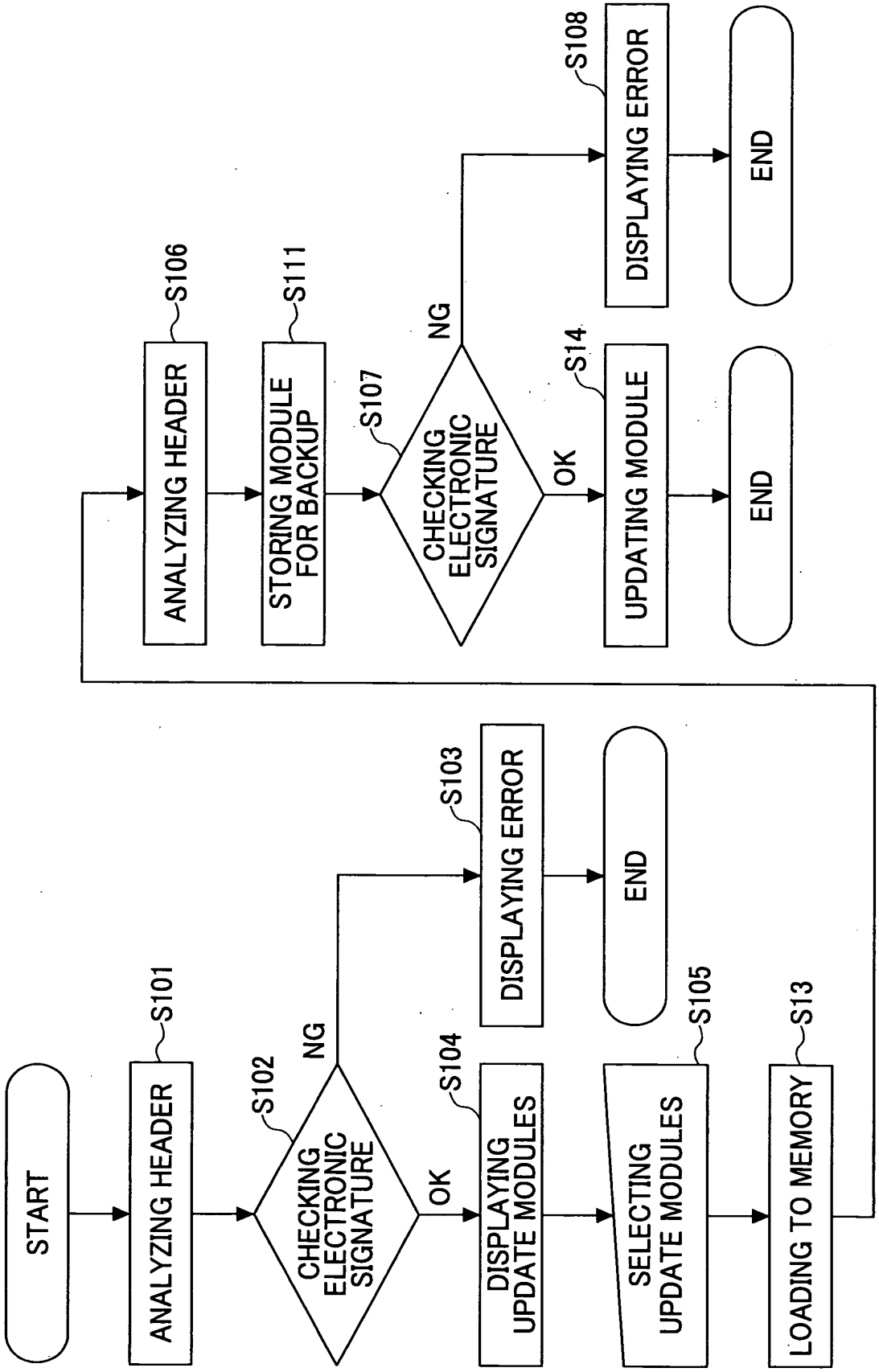

START
ANALYZING HEADER
S101
CHECKING ELECTRONIC SIGNATURE
S102
NG
OK
DISPLAYING ERROR
S103
END
DISPLAYING UPDATE MODULES
S104
SELECTING UPDATE MODULES
S105
LOADING TO MEMORY
S13
ANALYZING HEADER
S106
STORING MODULE FOR BACKUP
S111
CHECKING ELECTRONIC SIGNATURE
S107
NG
OK
DISPLAYING ERROR
S108
END
UPDATING MODULE
S14
END

FIG.19

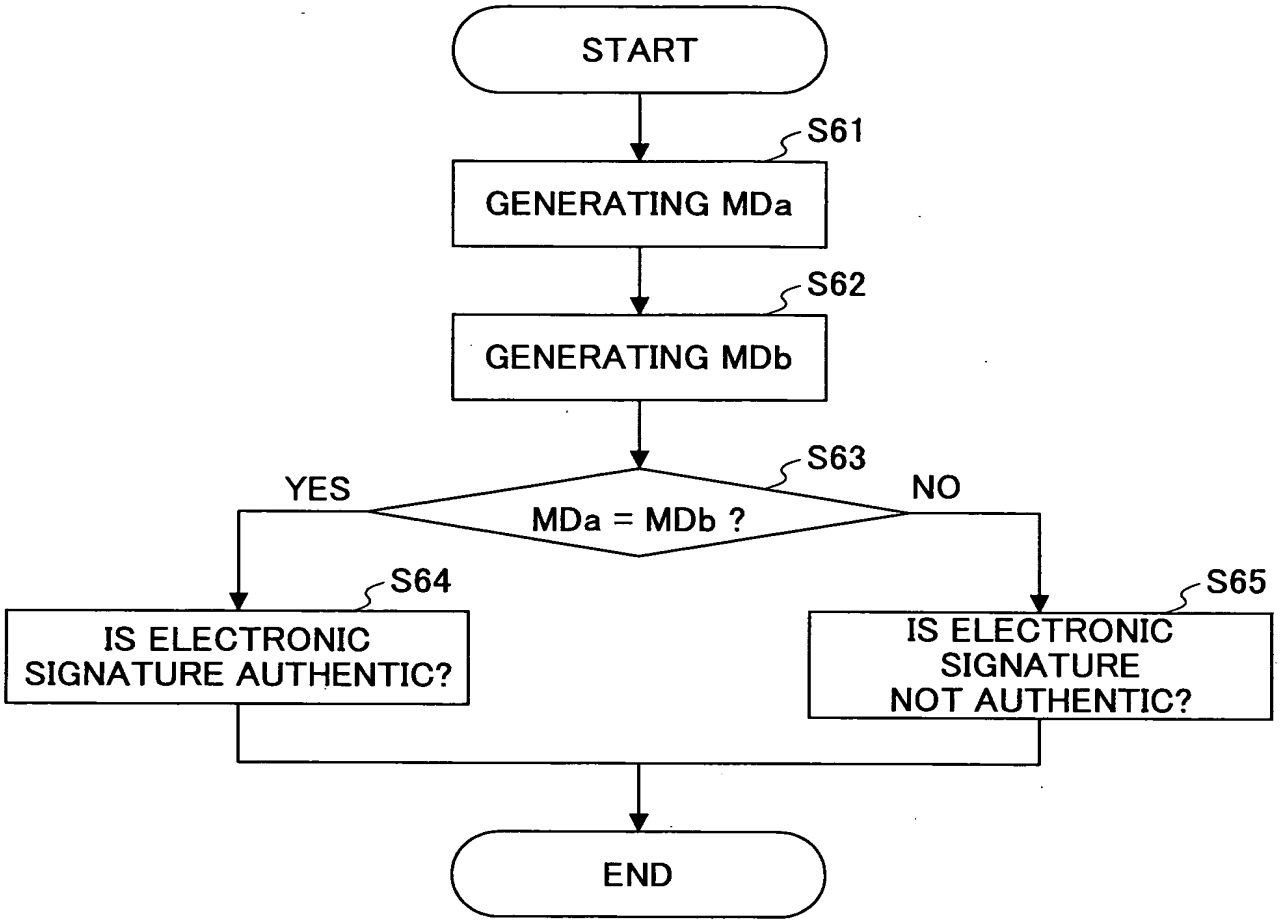

START
S61
GENERATING MDa
S62
GENERATING MDb
S63
YES
MDa = MDb ?
NO
S64
IS ELECTRONIC SIGNATURE AUTHENTIC?
S65
IS ELECTRONIC SIGNATURE NOT AUTHENTIC?
END

FIG.20

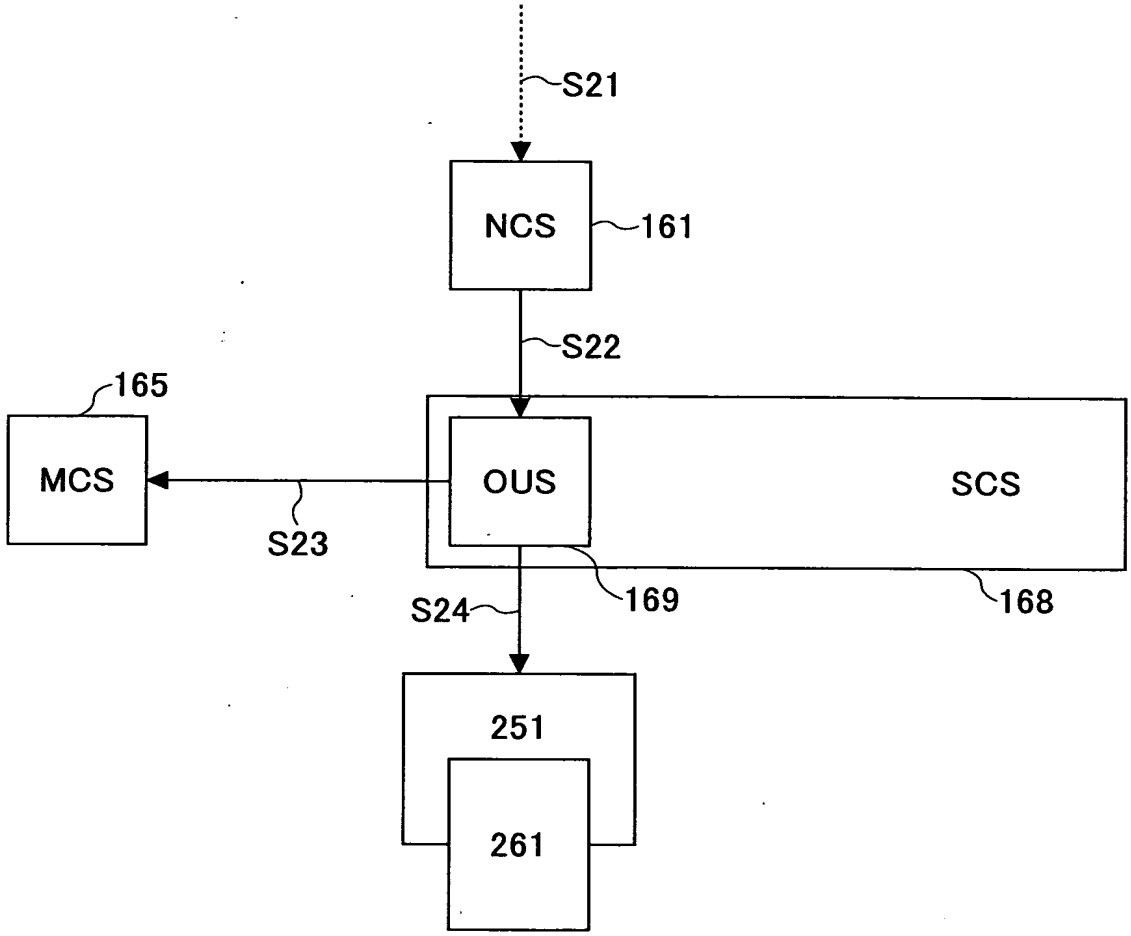


FIG.21

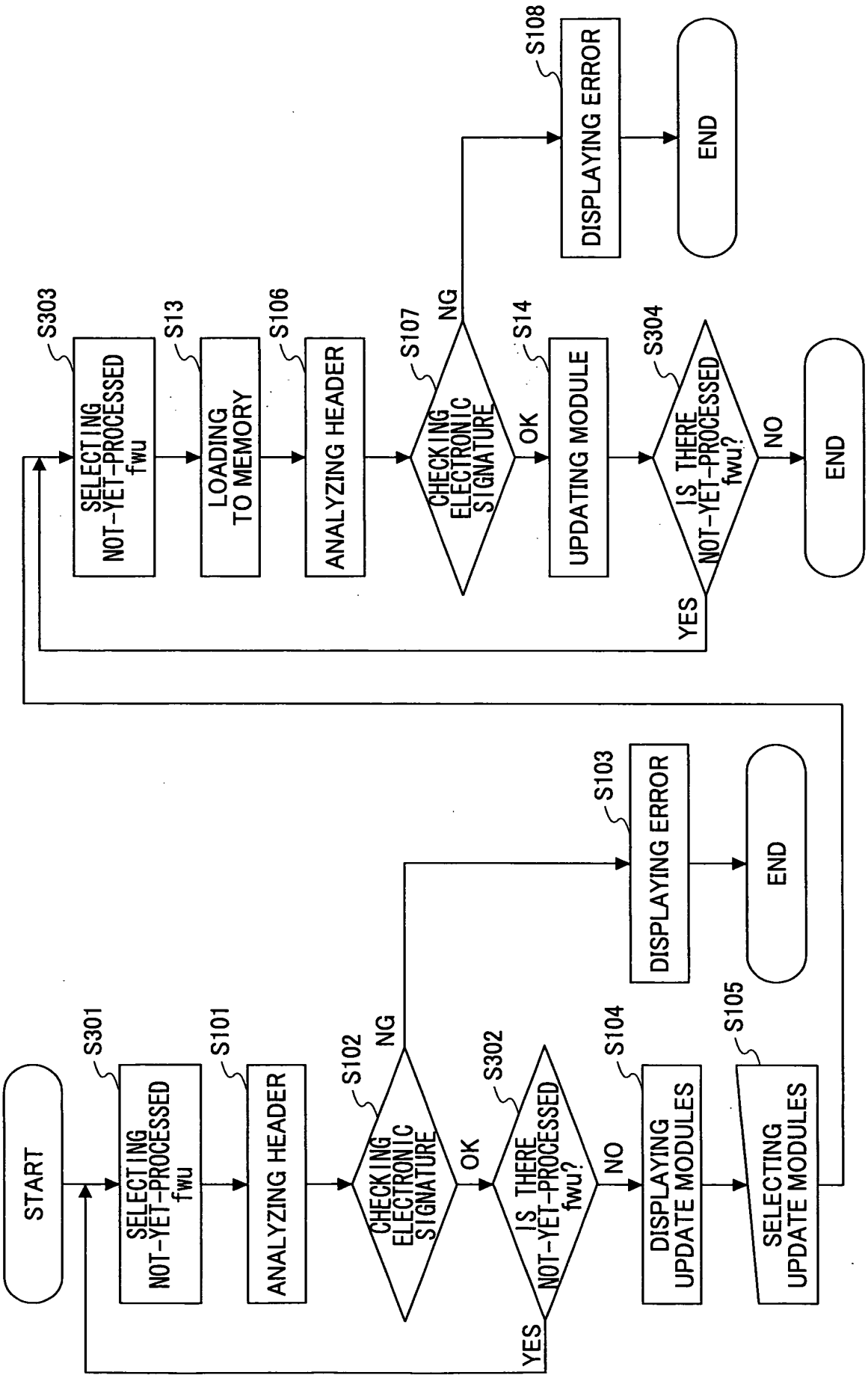

START
S301
SELECTING NOT-YET-PROCESSED fwu
S101
ANALYZING HEADER
S102
CHECKING ELECTRONIC SIGNATURE
NG
S103
DISPLAYING ERROR
END
OK
S302
IS THERE NOT-YET-PROCESSED fwu?
YES
NO
S104
DISPLAYING UPDATE MODULES
S105
SELECTING UPDATE MODULES
S303
SELECTING NOT-YET-PROCESSED fwu
S13
LOADING TO MEMORY
S106
ANALYZING HEADER
S107
CHECKING ELECTRONIC SIGNATURE
NG
S108
DISPLAYING ERROR
END
OK
S14
UPDATING MODULE
S304
IS THERE NOT-YET-PROCESSED fwu?
YES
NO
END

FIG.22

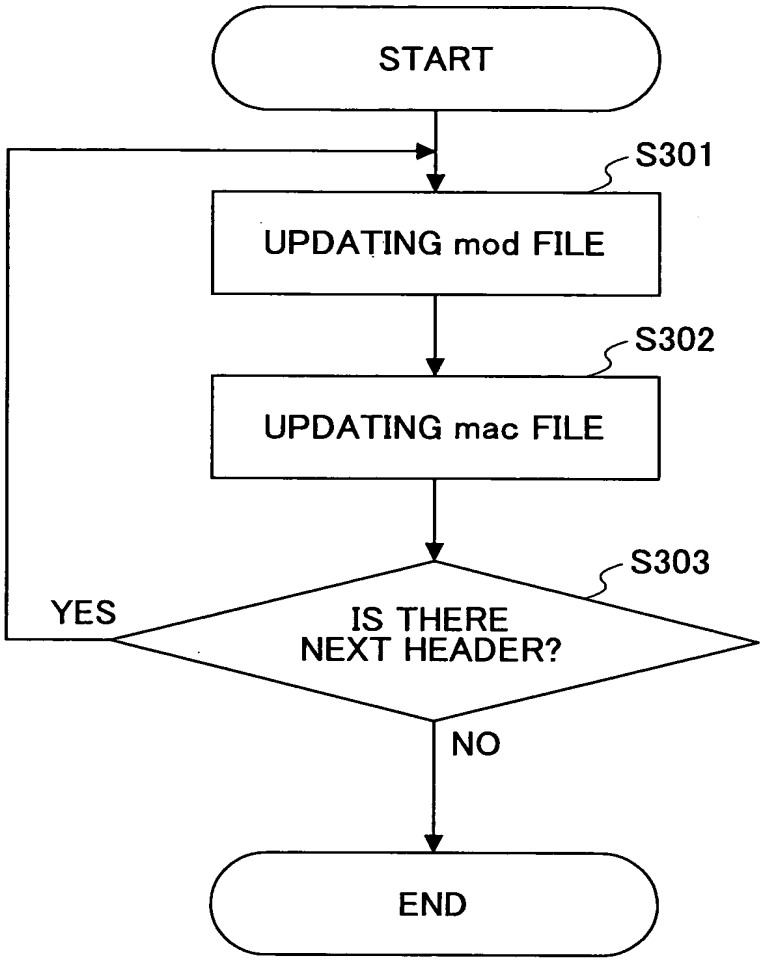

START
S301
UPDATING mod FILE
S302
UPDATING mac FILE
S303
YES
IS THERE
NEXT HEADER?
NO
END

FIG.23

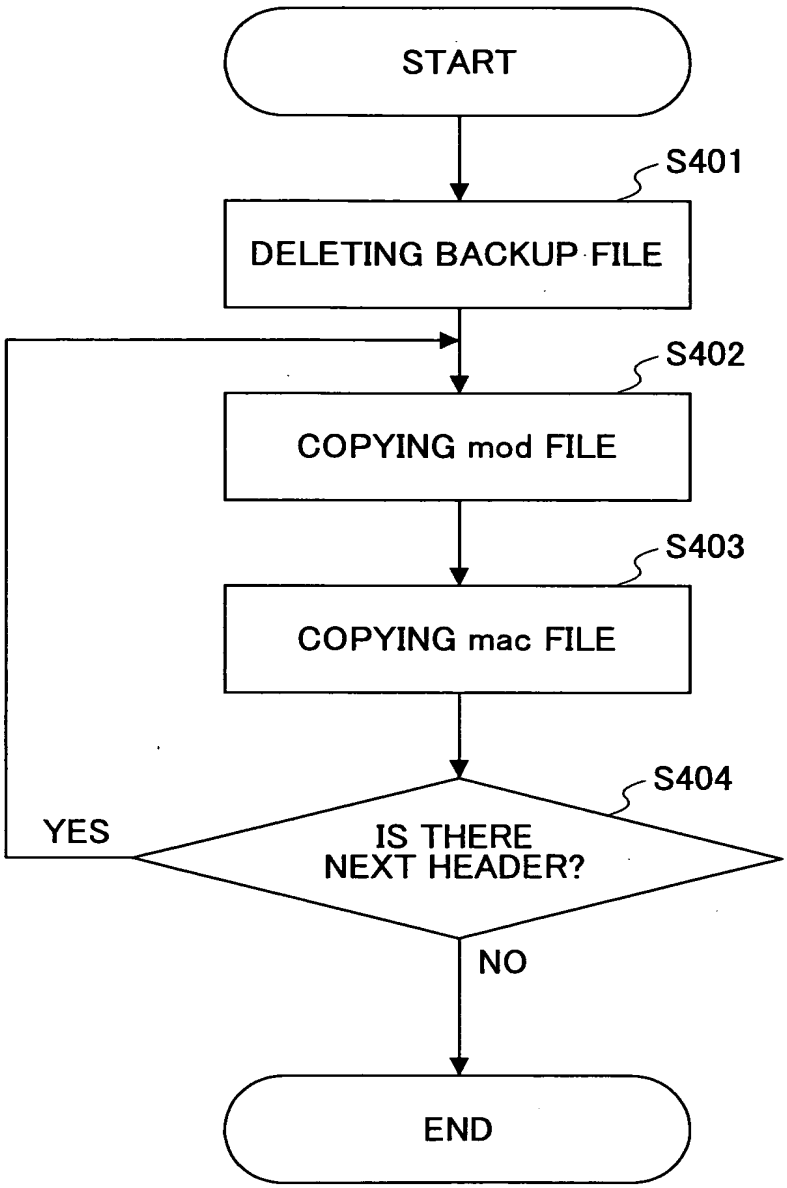

START
S401
DELETING BACKUP FILE
S402
COPYING mod FILE
S403
COPYING mac FILE
S404
IS THERE NEXT HEADER?
YES
NO
END

FIG.24

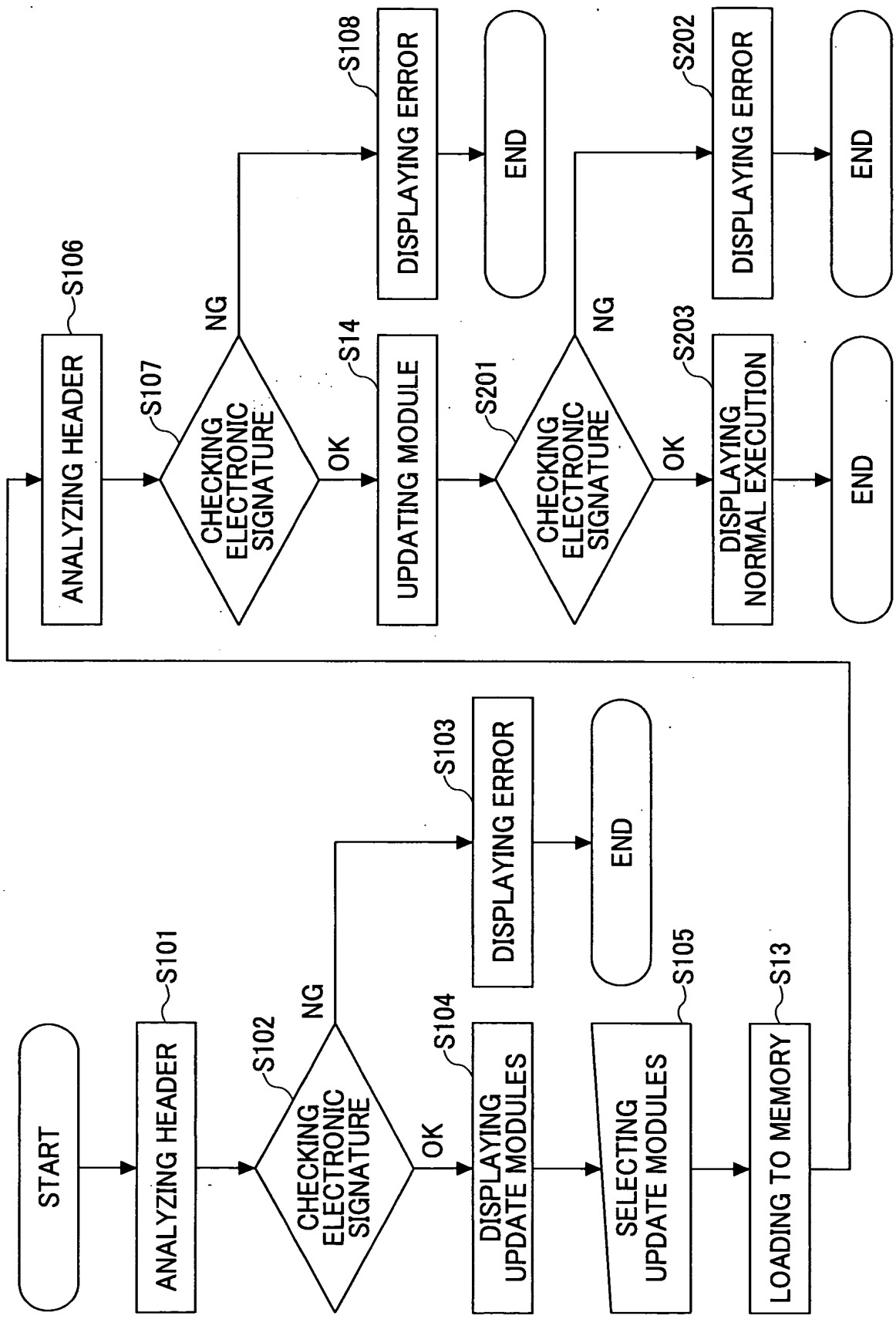

START
ANALYZING HEADER
S101
CHECKING ELECTRONIC SIGNATURE
S102
NG
OK
DISPLAYING ERROR
S103
END
DISPLAYING UPDATE MODULES
S104
SELECTING UPDATE MODULES
S105
LOADING TO MEMORY
S13
ANALYZING HEADER
S106
CHECKING ELECTRONIC SIGNATURE
S107
NG
DISPLAYING ERROR
S108
END
OK
UPDATING MODULE
S14
CHECKING ELECTRONIC SIGNATURE
S201
NG
DISPLAYING ERROR
S202
END
OK
DISPLAYING NORMAL EXECUTION
S203
END

FIG.25

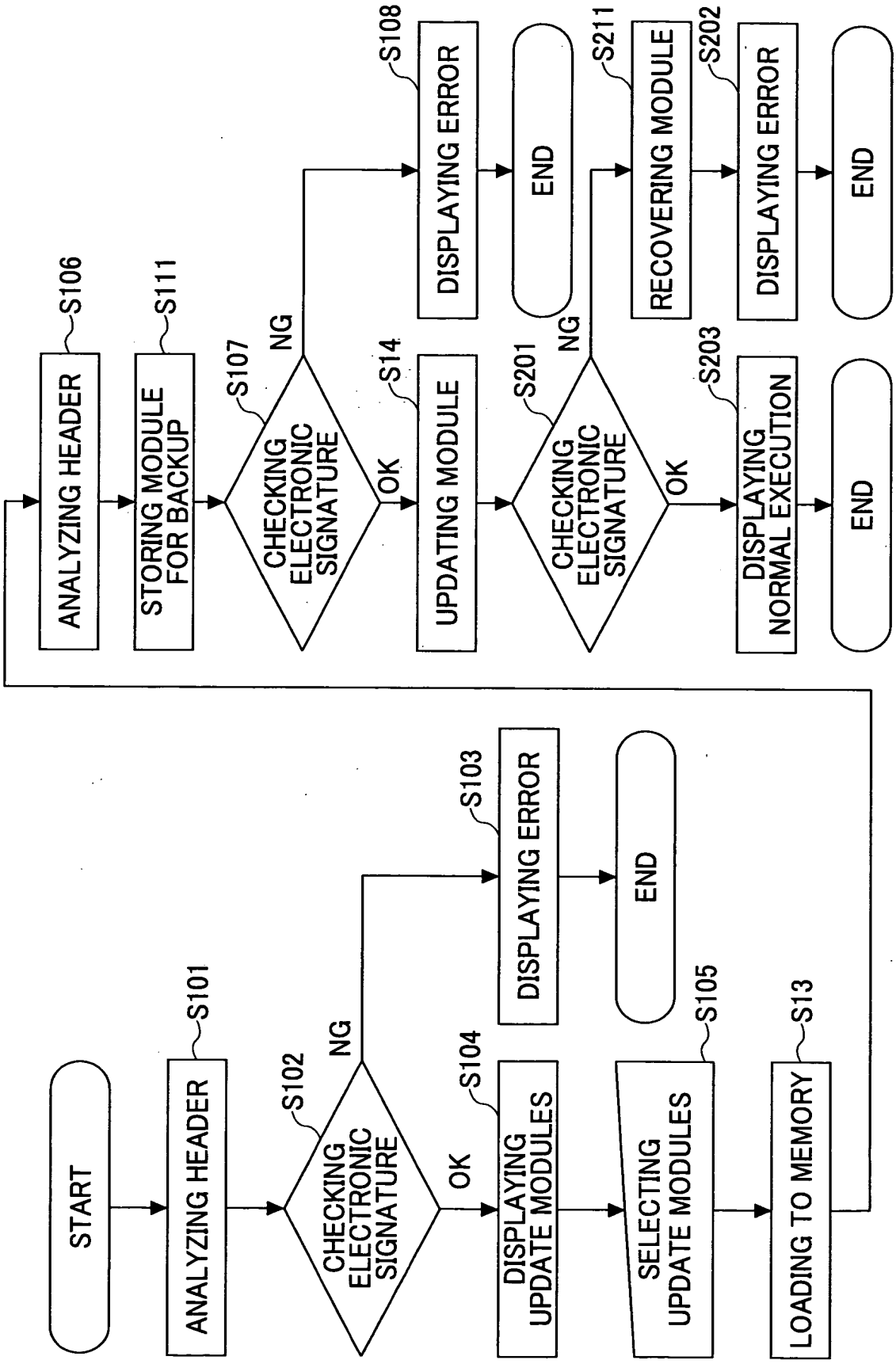

START
ANALYZING HEADER
S101
CHECKING ELECTRONIC SIGNATURE
S102
NG
OK
DISPLAYING ERROR
S103
END
DISPLAYING UPDATE MODULES
S104
SELECTING UPDATE MODULES
S105
LOADING TO MEMORY
S13
ANALYZING HEADER
S106
STORING MODULE FOR BACKUP
S111
CHECKING ELECTRONIC SIGNATURE
S107
NG
OK
DISPLAYING ERROR
S108
END
UPDATING MODULE
S14
CHECKING ELECTRONIC SIGNATURE
S201
NG
OK
RECOVERING MODULE
S211
DISPLAYING ERROR
S202
END
DISPLAYING NORMAL EXECUTION
S203
END

FIG.26

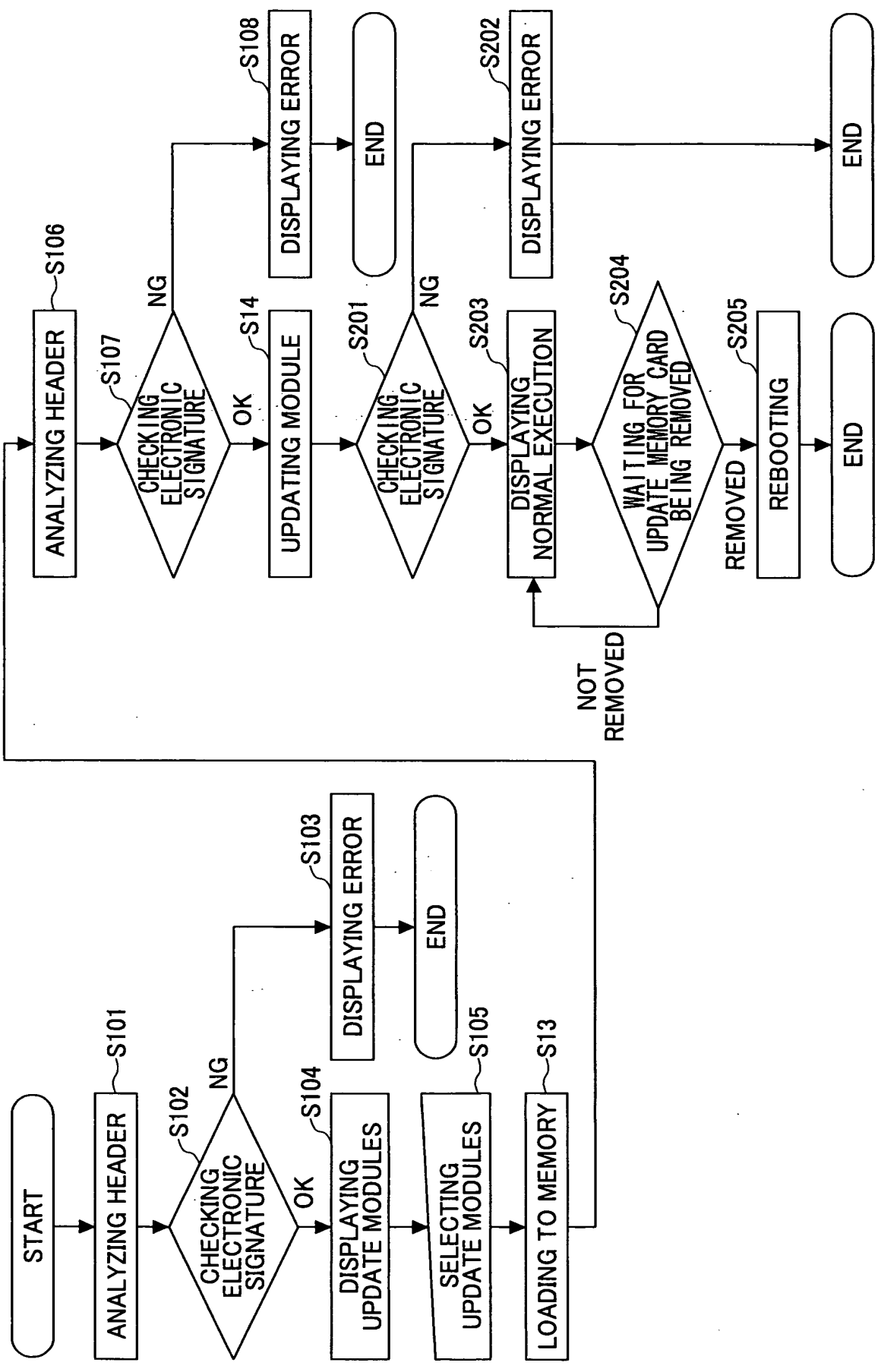

START
ANALYZING HEADER
S101
CHECKING ELECTRONIC SIGNATURE
S102
NG
OK
DISPLAYING ERROR
S103
END
DISPLAYING UPDATE MODULES
S104
SELECTING UPDATE MODULES
S105
LOADING TO MEMORY
S13
ANALYZING HEADER
S106
CHECKING ELECTRONIC SIGNATURE
S107
NG
OK
DISPLAYING ERROR
S108
END
UPDATING MODULE
S14
CHECKING ELECTRONIC SIGNATURE
S201
NG
OK
DISPLAYING ERROR
S202
END
DISPLAYING NORMAL EXECUTION
S203
WAITING FOR UPDATE MEMORY CARD BEING REMOVED
S204
NOT REMOVED
REMOVED
REBOOTING
S205
END

FIG.27

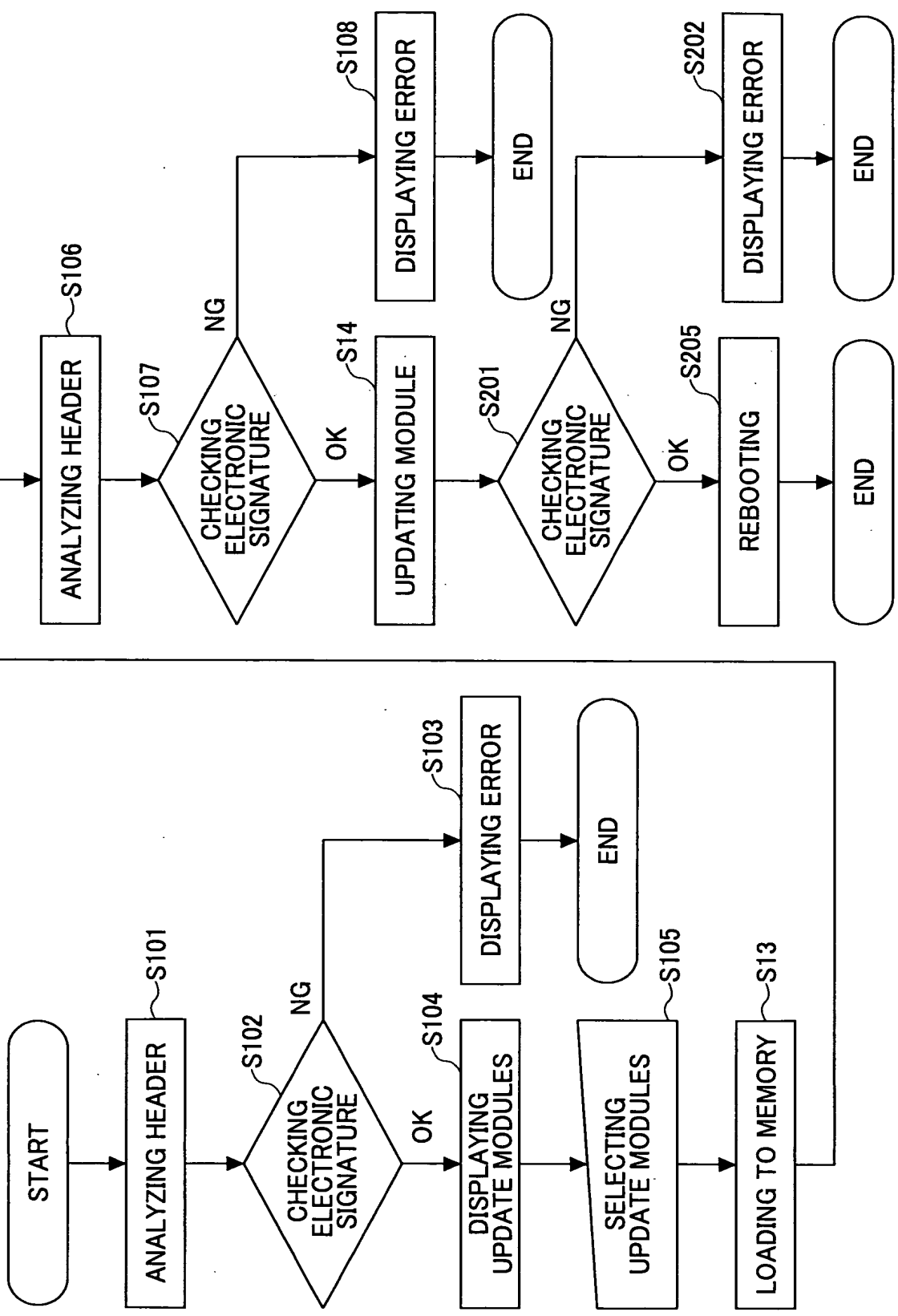
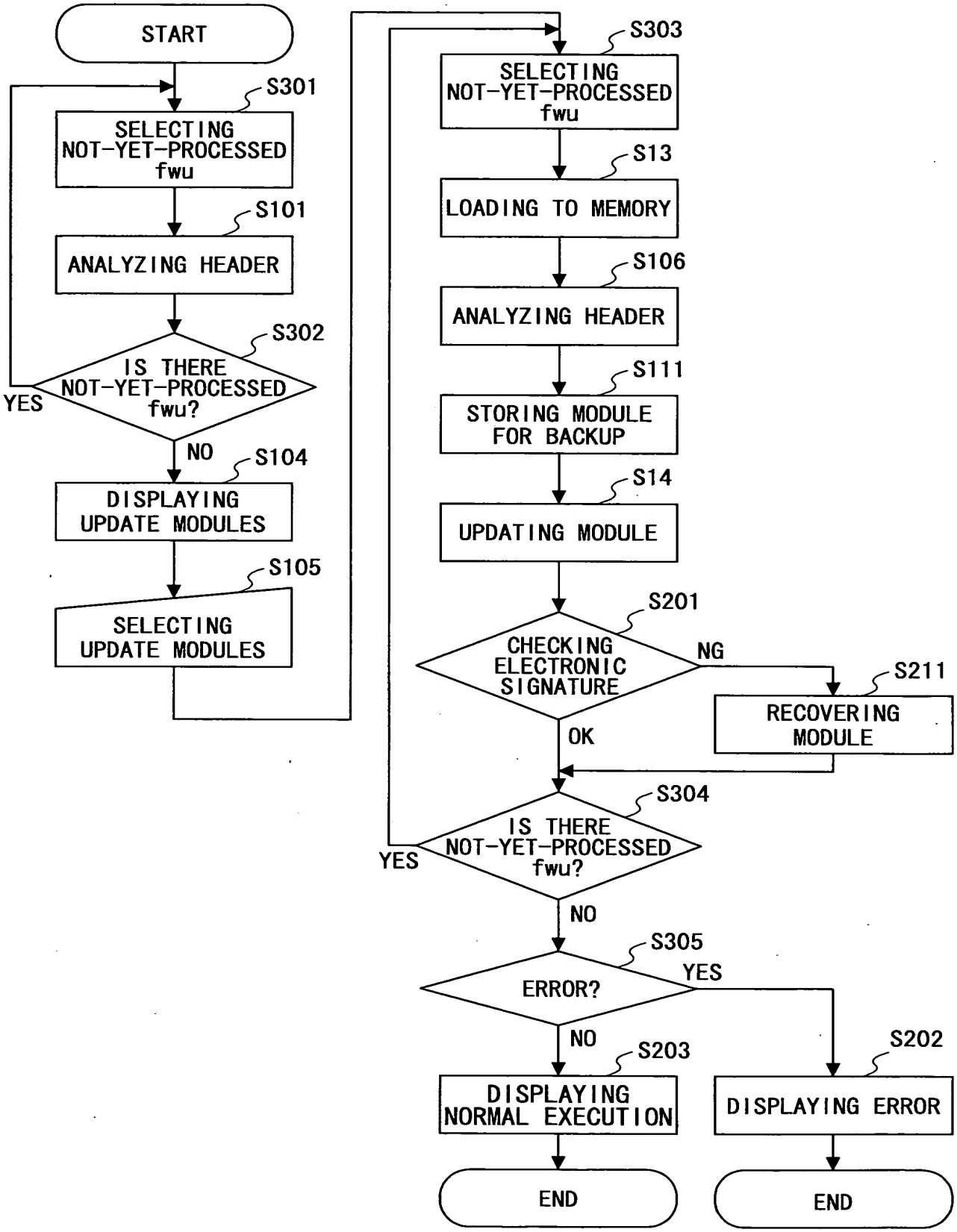

START
S101
ANALYZING HEADER
S102
CHECKING ELECTRONIC SIGNATURE
NG
S103
DISPLAYING ERROR
END
OK
S104
DISPLAYING UPDATE MODULES
S105
SELECTING UPDATE MODULES
S13
LOADING TO MEMORY
S106
ANALYZING HEADER
S107
CHECKING ELECTRONIC SIGNATURE
NG
S108
DISPLAYING ERROR
END
OK
S14
UPDATING MODULE
S201
CHECKING ELECTRONIC SIGNATURE
NG
S202
DISPLAYING ERROR
END
OK
S205
REBOOTING
END

FIG.28


START
S301
SELECTING NOT-YET-PROCESSED fwu
S101
ANALYZING HEADER
S302
IS THERE NOT-YET-PROCESSED fwu?
YES
NO
S104
DISPLAYING UPDATE MODULES
S105
SELECTING UPDATE MODULES
S303
SELECTING NOT-YET-PROCESSED fwu
S13
LOADING TO MEMORY
S106
ANALYZING HEADER
S111
STORING MODULE FOR BACKUP
S14
UPDATING MODULE
S201
CHECKING ELECTRONIC SIGNATURE
NG
S211
RECOVERING MODULE
OK
S304
IS THERE NOT-YET-PROCESSED fwu?
YES
NO
S305
ERROR?
YES
NO
S203
DISPLAYING NORMAL EXECUTION
S202
DISPLAYING ERROR
END
END

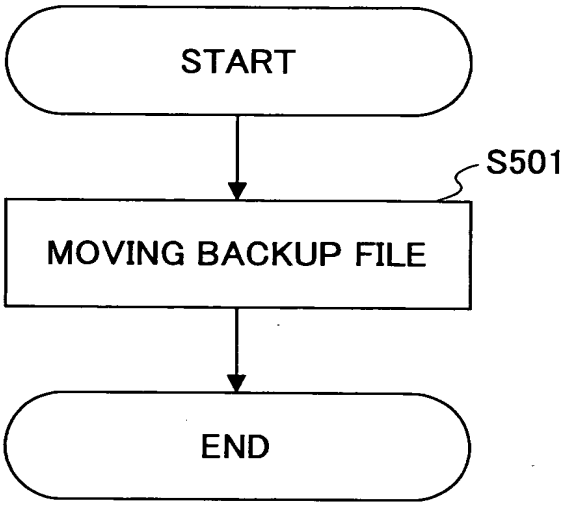



FIG.29